

FINAL REPORT

**THREATENED, ENDANGERED AND RARE PLANT
SPECIES OF GLEN CANYON NATIONAL RECREATION AREA**

1992 SURVEY WORK

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Glen Canyon National Recreation Area**

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1. INTRODUCTION

Glen Canyon National Recreation Area (NRA) harbors 16 known federally listed or candidate plant species, though inventory surveys have been very limited. Of these, two are listed, Cycladenia humilis var. jonesii (listed threatened; see appendix for categories), and Pediocactus bradyi (listed endangered). One species has been proposed for C1 (deserves listing as a threatened or endangered species) ranking, Perityle specuicola. The remaining 13 species are either C2 candidates (may be endangered or threatened but more information needed) or 3C species (not currently considered in danger or rare enough to be listed). At least four additional species, not considered, warrant special concern in Utah. Below the status of each of these species is brought up to date, based on 1992 field work. Following this, other species in the region that may eventually be found within Glen Canyon NRA are listed.

A. Listed Species

1. Cycladenia humilis Benth. var. jonesii (Eastw.) Welsh & Atwood (threatened)

The Glen Canyon NRA population of this species occurs in the Purple Hills near Capitol Reef NP. Ken Heil (pers. comm. 1992) states that several other small populations occur on the Chinle formation in the vicinity. The species is strongly clonal at the Purple Hills site, where an estimated 2500 ramets occur. Flower and fruit set data, plant size, density, herbivory, and seed set data were collected from this population on June 25. Permanent line transects were established around the tip of the Purple Hills, and 252 ramets were mapped for relocation. This work will be prepared as a report at a later date.

The variety is only known from four locations, three in Utah and one in Arizona. The Purple Hills population is critical for the long term survival of the variety. The Utah State University USDA Bee Lab is currently working on the

pollination and reproductive ecology and genetics of the variety. Sedonia Sipes, a graduate student, is doing the work for her M.Sc. She has indicated that the Purple Hills population is genetically distinct from other populations, and that the variety is distinct from C. humilis var. humilis, which occurs in the mountains of California. Variety jonesii may be eventually reinstated as a full species.

2. Pediocactus bradyi L. Benson (Listed endangered)

This species occurs along the Colorado River corridor between Lee's Ferry and the Little Colorado River. The Glen Canyon NRA population is currently being monitored and studied (Spence 1992a).

B. C1 species

3. Perityle specuicola Welsh & Neese

This species is found near the mouth of Dark Canyon and along Cataract Canyon just upstream, as well as further north in Arches and Canyonlands NP's. During field 1992 work in Clearwater Canyon, a new population was discovered. The plants were growing in Cedar Mesa sandstone along the margins of the dry, largely slickrock, stream channel in the canyon bottom. About 20 plants were seen, in full flower when discovered (August 13). The flowers are yellow rather than white, as originally thought (Welsh et al. 1987). Currently, three populations are known from Glen Canyon NRA.

C. C2 species

4. Astragalus preusii Gray var. cutleri Barneby

This species is known in Glen Canyon NRA from Cataract Canyon, near the Big Drop rapids. It was not seen during 1992 and its status remains unchanged.

5. Camissonia atwoodii Cronq.

Camissonia atwoodii is found scattered on clay soils derived from the

Tropic and Carmel formations in the Rock Creek area and on East Clark Bench. It was not seen during the 1992 season. The status and distribution of the species remains unchanged. Its total distribution and population size within Glen Canyon NRA is not known.

6. Carex curatorum Stacey

The Canyonlands sedge is a common species in hanging gardens throughout Glen Canyon NRA. Its status as a rare species rests mainly on its limited distribution, which is primarily along the Colorado River from Canyonlands NP to Grand Canyon NP. It was seen numerous times during the 1992 season.

7. Cymopterus acaulis (Pursh) Raf. var. higginsii (Welsh) Goodrich

Higgins biscuitroot is found on clay soils of the Tropic formation, from ca. Big Water to Grand Bench. Its total distribution in Glen Canyon NRA remains unknown. The variety was placed under the common C. acaulis by Welsh et al. (1987), but without any justification. It may eventually be reinstated as a full species.

8. Dalea flavescens (Wats.) Welsh var. epica (Welsh) Welsh & Chatterly

The Hole-in-the-Rock prairie clover is a rare but widely distributed species of the Hall's Creek and Escalante drainages, where it grows in sandy and rocky blackbrush and mixed desert shrub communities. Glen Canyon NRA localities include the Hall's Crossing area and Ticaboo Canyon. It was not seen during the 1992 season, and its status remains unchanged.

9. Erigeron kachinensis Welsh & Moore

Kachina daisy is known from seeps and hanging gardens in the Cedar Mesa formation. The main populations occur in Natural Bridges NM and the Grand Gulch area. During field work in Clearwater Canyon on August 13, 1992, this species was discovered in a west facing seep at the base of the Cedar Mesa cliffs in the

middle part of the canyon, growing with Carex curatorum. This is a new report for Glen Canyon NRA, where it was not previously known. The elevation, ca. 4800 feet, is somewhat lower than its previous known elevational range of 5300-8400 feet. The number of individuals was estimated to be ca. 100, and were in full flower at the time of collection.

10. E. zothecinus Welsh

The alcove daisy is restricted to hanging gardens and seeps near the confluence of the Escalante River. This species was not seen during 1992 surveys of hanging gardens in Cow Canyon. Its distribution and status remain unchanged.

11. Habenaria zothecina Higgins & Welsh

The alcove bog orchid is found in hanging gardens, seeps and springs, and along streams between ca. 3700-8700 feet. It occurs in hanging gardens in Glen Canyon NRA, although it is never common. During 1992 survey work, the species was found in only 1 of 25 gardens. It was found in 4 out of 12 gardens in a survey in 1991 (Spence 1991). A significant new locality for this species was the isolated Douglas fir tree stand in an alcove in upper Miller's Creek, where it was growing with Smilacina stellata along the small stream issuing from the spring in the alcove. More information on this site can be found in Spence (1992b).

12. Ostrya knowltonii Cov.

The western hophornbeam is a tertiary relict that is distributed in southern Utah, New Mexico, Arizona, and Texas. The species is rare throughout its range. During the 1992 field season it was found in relict mixed deciduous woodland in Cow and Clearwater canyons, and the Douglas fir grove in upper Miller's Creek (Spence 1992b). It was also seen in one hanging garden in Ribbon Canyon, where it has been previously reported. The Clearwater Canyon and upper

Miller's Creek reports are new locations for this species.

13. Psorothamnus thompsoniae var. whittingii

This taxon occurs in the Piute Farms area, on sandy soils in the mixed shrub desert vegetation near the San Juan River and Lake Powell. It is not known if populations are actually in Glen Canyon NRA, but it is known from very near the park boundary. The taxon was not seen during the 1992 field season.

14. Viguiera soliceps Barneby

The Tropic goldeneye is found on on the Tropic shale formation in Kane County. It occurs on this formation within Glen canyon NRA to the north and east of Big Water. Originally considered a 3C species, V. soliceps has been found to be more rare than originally thought, and has been upgraded to C2 status.

D. 3C species

* 15. Astragalus monumentalis Barneby

The Monument milkvetch is found in southeastern Utah in pinyon-juniper and desert shrub communities. It is not uncommon in the appropriate habitat, and is not considered to be currently threatened.

16. Phacelia howelliana Atwood

The Howell scorpion weed is widely distributed in eastern Utah on clay and basalt-derived soils in desert shrub communities, and is not currently considered threatened.

E. Other rare species

Cladium californicum (Wats.) O'Neill

Sawgrass is extremely rare in Utah, as most populations have been drowned by Lake Powell. Prior to 1991 sawgrass was only known with certainty in the state from a single garden in Hidden Passage Canyon, although it has been reported also from lower Wilson's Creek and Driftwood Canyon. In 1991, populations of sawgrass

were found in the riparian zone of "Garden" Canyon, two hanging gardens on the cliffs above Lake Powell, one hanging garden in Alcove Canyon, and the riparian zone of Alcove Canyon, in all five populations (Spence 1991). The San Juan arm seems to be the principal center for surviving populations of this species. All known state populations are from Glen Canyon NRA. The reports from Driftwood and lower Wilson's need to be verified. The species was not seen in lower Wilson's Creek at the reported locality in May of 1992. Sawgrass has been reported from Cow Canyon (Tuhy and MacMahon 1988). It was not seen during an extensive survey of the canyon, however.

Imperata brevifolia Vasey

Satintail grass is known from a single location in Utah, along the stream in lower Wilson's Creek. It was not seen during vegetation surveys of this canyon in May of 1992, but this is probably too early. Satintail grass is a late flowerer and the best time to search for it would be September or October. Despite searches in other canyons during 1992, this species was not seen anywhere else in Glen Canyon NRA.

Rubus neomexicanus Gray

New Mexico raspberry is found in a few hanging gardens in Knowles, Ribbon, and Cataract canyons in Glen Canyon NRA. In 1992 the species was discovered growing in a patch of Ostrya woodland in Clearwater Canyon (Spence 1992b). This is a new locality and a new habitat. It is very rare in Utah, and all known state populations are in Glen Canyon NRA.

Zigadenus vaginatus (Rydb.) Macbr.

The alcove deathcamas is a rare species found in hanging gardens on the Colorado Plateau. Its relationships are with species like Z. volcanicus of Central America, according to Welsh (1989). In Glen Canyon NRA it occurs in some

gardens in the San Juan arm and near its confluence with Lake Powell, and in Reflection Canyon. During 1991 and 1992 surveys the species was found in only 3 out of 37 gardens, two in Ribbon Canyon and one in Cow Canyon. It is probably at least as rare in Glen Canyon NRA as Habenaria zothecina.

F. Possible species

Asclepias cutleri Woodson (3C species)

The Cutler milkweed is known from sandy sites in desert shrub and pinyon-juniper woodland from southeastern Utah, mostly on the Navajo Nation. It is not yet known from Glen Canyon NRA, but may eventually be found along the San Juan River or between it and Lake Powell.

Asclepias welshii N. & P. Holmgren (listed threatened)

The Welsh milkweed is a distinctive species found on sand dunes to the west of Glen Canyon NRA, with its main population occurring at Coral Pink Sand Dunes. Recent sightings, however, have been made east of Page on the Navajo Nation and west of Glen Canyon Dam near the Paria River canyon rim. It should be sought along the park's western boundary on sand deposits.

Carex specuicola J.T. Howell (listed threatened)

The Navajo sedge is found in seeps and hanging gardens at moderately high elevations (5700-6000 feet) on the Navajo Nation. A survey in the San Juan arm of Lake Powell failed to find the species (Spence 1991). The combination of high elevation and hanging garden habitat suggests that a search of gardens in the Waterpocket Fold or upper Escalante River canyons draining the fold may locate the species.

Iris pariensis Welsh (C2 species)

The Paria Iris had not been relocated since being collected at the type locality. However, in 1992 the species was seen in the Telegraph Flat area to the

west of Kanab and south of Utah Highway 89. The type location is on the East Clark Bench south of Highway 89. In the spring of 1993 a coordinated search for the species is to be conducted by the U.S. Fish & Wildlife Service, State of Utah, and the BLM-Cedar City district. The National Park Service should be included in this effort as there is a good chance of locating the species on the western fringes of the park.

Penstemon atwoodii Welsh (C2 species)

Atwood's Penstemon is known from the Kaiparowits, Wahweap, and Straight Cliffs formations on clay and loam soils in pinyon-juniper woodland to the north of Glen Canyon NRA. Some of this habitat occurs in Glen Canyon NRA, especially at the south end of the Kaiparowits Plateau. This species may eventually be found within the park.

Spiranthes diluvialis Sheviak (listed threatened)

This orchid, known as the Ute Lady-tresses, has recently been listed as threatened (January 17, 1992). It is found in Utah, Nevada, and Colorado, in low elevation marshes along rivers. The closest known population is along the Fremont River in Capitol Reef NP. There is a possibility of finding this species in backwater marshy sites along permanent streams, such as in Bowns Canyon or along the Escalante River. It was not seen during 1992 surveys.

2. LITERATURE CITED

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3. APPENDIX

1. Federal Categories

- Listed Endangered: taxon formally listed as endangered; ie., in danger of extinction throughout all or most of its range.
- Listed Threatened: taxon formally listed as threatened; ie., likely to become endangered in the foreseeable.
- C1: substantial information on hand to support listing the taxon as either endangered or threatened.
- C2: information suggests the taxon may be appropriate for listing as endangered or threatened, but more biological studies are needed to confirm this.
- 3A: taxon considered to be extinct.
- 3B: entity is not considered a valid taxon.
- 3C: taxon recently found to be more widespread or abundant than previously thought, not currently considered threatened or endangered.